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Electrical Apparatus  
used in Nasal  
Surgery.

*With Practical Demonstrations.*

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## THE NASAL TREPHINE AND ITS ADVANTAGES.

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NASAL SURGERY.

*WITH PRACTICAL DEMONSTRATIONS.\**

BY H. HOLBROOK CURTIS, M. D.

THE subject of nasal surgery has of late received so much attention, both in current medical literature and in the papers read before this section, that it would be a presumption on my part to offer anything which I could strictly claim as original; but the application of a very ingenious device to nasal work forms the subject of a few remarks which I propose to make to-night. I wish first to speak of deviations of the septum, which some writers consider due either to unequal growth of the skull and bones of the face, or to unequal development of the cerebral hemispheres. Ziem considers that deviation is chiefly due to falls on the nose in first attempting to walk, blows with the fist, and accidental fractures; while Welcker considers the position of the infant in sleep to be a reasonable explanation of the deformity.

\* Read before the Section in Laryngology of the New York Academy of Medicine, March 23, 1887.

Ziem has, however, proved that every obstruction of the nostril exerts an important effect on cranial development. In a young animal, one of whose nostrils was completely closed for a long time, was observed a deviation of the inter-maxillary bone and of the sagittal suture to the closed side, lesser length of the nasal bone, of the frontal bone, and of the horizontal plate of the palate bone, less steep elevations of the alveolar processes, less distance between the bony auditory capsule and the alveolar process, also between the zygomatic arch and supra-orbital border, likewise diminished size and asymmetrical position of the vascular and nerve canals on the closed side of the nose. The distance of the orbits from the median line was unequal, which, as has been observed in man, leads to asthenopia, astigmatism, and strabismus.

Lastly, certain spinal curvatures seem also to be due to nasal obstruction. It therefore seems reasonable to suppose that a deviated septum may be the cause and not the result of unequal skull development.

The province of this paper does not include an inquiry into the cause of deviation of the septum; suffice it that it exists. Morell Mackenzie reports that in 2,152 skulls 1,657 were found with deviation of the septum, viz., 76·9 per cent.; while of 538 symmetrical septa only 22·6 per cent. were of European skulls, nearly one half of these being found in Italian crania. As these investigations only refer to deviation of the bony septa, they are of little value, as in a majority of cases which demand operative interference the correction of the deformity and consequent relief of stenosis lie in excision of the cartilaginous projection or deviation, a much more frequent cause of stenosis than the true bony deflection.

The question of asymmetry of the nasal septum has been thoroughly studied since the time of Quernmalz, 1750, by



Morgagni, Haller, Hildebrant, and Velpeau. To Chassaignac, in 1851, is attributed the first suggestion as to operative interference. His suggestions were improved and further developed by Blandin, Adams, Jurasz, Theile, and others, who advocated their respective methods; but not until within the past ten years has any operation which can be considered as thoroughly practical and satisfactory been advanced which would in every case allow of a proper correction of the deformity. Dr. Goodwillie, of this city, in a paper read before the American Medical Association in July, 1880, entitled "The Surgical Treatment of Naso-pharyngeal Catarrh," first clearly defined his position as to the relationship existing between catarrh and stenosis due to deviation of the septum; though in a paper entitled "Extirpation of the Bones of the Nose and Mouth by the Aid of the Surgical Engine," published in July, 1879, in the "Medical Record," of this city, he had somewhat anticipated his conclusions.

To Dr. Goodwillie's ingenuity are we chiefly indebted for the application of the surgical engine to nasal work, and also for perfecting the so-called revolving knives which are well known to us under his name. The operation of transfixing and removing cartilaginous deviations was suggested by Dr. W. C. Jarvis, who used his snare for the purpose. To whom the introduction of the nasal saw belongs is at present in dispute, though to Dr. Bosworth generally redounds the credit of popularizing its use, and crediting it with its well-deserved efficiency.

While I do not wish to depreciate in any way the very valuable instruments at present employed, I beg to add another modification to existing methods.

In a very general use of the nasal saw during the past two years, I have met with so many cases in which its employment was not practicable that I have been experimenting

#### 4 THE NASAL TREPHINE AND ITS ADVANTAGES.

as to a quicker and better means of removing nasal obstructions. I have adopted a combination of the saw and Goodwillie's revolving knives and drills, and I think have produced an instrument which, certainly in my hands, works in a most thoroughly satisfactory manner. The idea was suggested to me by Dr. W. W. Walker, a surgeon dentist of this city, who uses a somewhat similar instrument in implanting artificial teeth in the alveolar process. The particular advantages which I maintain for the nasal trephine are: 1. Greater celerity in work than is possible by any other method. 2. That the tissues beyond the deviation are not lacerated. 3. That a perfectly clean bore is made and the operator is not annoyed by hæmorrhage. 4. When the position of the posterior face of a deviated septum is invisible, it is possible to make an exploratory channel. 5. That a considerable portion of the nervous shock of a sawing operation is done away with. 6. That bone may be removed with much less motive power and with greater accuracy than by other existing methods.

To better illustrate my method, I submit the instrument, and also wish to call attention to a very convenient electro-motor and battery which I employ to supply motive power.

I have taken the electro-motor known as the "Challenge" and caused it to be incased in a nickel-plated cylindrical box to prevent entrance of dust and for the purpose of hiding the actual machinery. To the motor are attached the flexible cable and chuck, such as are employed on the surgical engine, in which the trephines are inserted. For greater convenience, I have been employing in my operating-room a constant galvanic battery known as the "Volta-pavia," made on the principle of a Leclanché cell, having a porous cup, zinc and carbon elements, and two fluids. Six cells of this battery give about twenty ampères of current

with an electro-motive force of twelve volts. For general office-work the battery does not require filling oftener than every six weeks, and permits daily use of the motor, thermo-cauteries, and a small lamp. By employing a battery

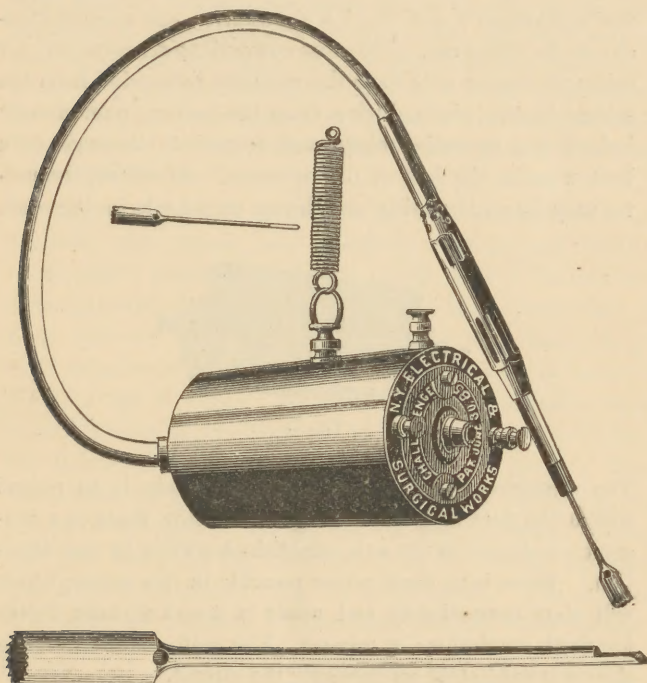


FIG. 1.

of this description, all plunging of plates is done away with, and also the annoyance of mixing new solutions. When one is constantly using the cauterizing points and motor this is a matter of great convenience. I show also the Gibson storage-cell, which is a superior attachment, where constant



use is being made of the current. This cell must be fed from gravity batteries, which may be placed in the yard or cellar. The storage-battery, so called, will undoubtedly come into general use when the expense of the plant is diminished. I have also before me on the table Schweig's, Piffard's, Stammer's, and the C. & C. batteries—all excellent machines for office use. The most convenient arrangement for using the motor is to have the machine suspended from the ceiling by the insulated wires from the battery, immediately behind the operating chair, and contact to be made by a button under the foot of the operator. After use, the motor may be swung aside and hung on a hook in the wall.

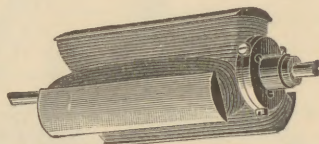


FIG. 2.

The armature, consisting of three segments, is so placed within the field that, on closing the circuit, there is a constant revolution of the axis established always in one direction. There is no dead center possible in this motor, which will start immediately and attain a speed of over fifteen hundred revolutions a minute. The motor stops working almost immediately on breaking the circuit.

Before speaking further of the motor and its arrangement, I will cite a case or two to explain the method of operating:

CASE I.—Mr. B., aged forty, suffered from so-called post-nasal catarrh for many years. There was found total occlusion of right nostril from a vertical acute deflection of the septal cartilage, involving a slight portion of the vomer in the posterior



face. The deflection was so marked that the nose showed a prominence above the ala of the right nostril, causing disfigurement. On March 6th the patient was operated on, two perforations being made one above the other, removing the ridge of the deflection, and permitting some entrance of air to the right nostril. Considerable hæmorrhage ensued, which was controlled in a few minutes. On March 15th, the relief having been very great from the preliminary operation, the patient returned and allowed three perforations to be made, an operation lasting less than one minute, and giving a free nasal channel. The process of healing closed a slight fenestration and gave a most excellent result.

The special points of interest in this operation were as follows: The patient was extremely nervous and debilitated, and I feared too great a shock from a continuous operation with the saw, as I should have had to encounter a bony plate on the posterior face of the deflection, which often requires some time to excise, and disagreeable hæmorrhage is apt to occur. In taking out a cylindrical section at each sitting, a procedure lasting but about four seconds, the horror of an operation is mitigated. I have in two cases been obliged to discontinue a sawing operation by reason of the patient having fainted, not on account of actual pain, but from the continued noise of the saw and the associations connected with its employment. The operation with the trephine is absolutely painless when cocaine is applied to the mucous membrane, and none of that maceration of the tissues results which takes place when the revolving knives are used; nor is there any danger of sudden deflection from the point of original contact, a thing which frequently occurs with the knives when brought to bear on the bony ridge of a deviation.

CASE II.—Miss L., of Brooklyn, aged twenty-two. Chronic post-nasal catarrh, with Eustachian catarrh, deafness, and very disagreeable tinnitus aurium.

Condition of nares as follows: Nearly complete stenosis on both sides due to sharp horizontal deflection of septum into right nasal cavity, occluding the inferior meatus, and true hypertrophy of left inferior turbinated body, the changed erectile tissue of which anteriorly was not contracted by cocaine nor by application of chromic acid (hence true hypertrophy). The patient was a confirmed mouth-breather. Assisted by Dr. Vincent Bowditch, of Boston, I attached a  $\frac{3}{16}$ -inch trephine to the electro-motor and took off the anterior prominence of the ridge of the septal deformity, the bone extending half an inch where the meatus was pervious. Quickly introducing a plug of absorbent cotton, as there was no great hæmorrhage but simply an oozing, I entered the left nostril and removed that portion of the inferior border of the turbinated body which occluded the meatus. From this there was no loss of blood, and the core which remained in the trephine had the macroscopic appearance of cartilage. The patient in ten days' time presented herself with both inferior meatus thoroughly open, and with a comparative freedom from her catarrhal symptoms. At present there is a slight abatement of the tinnitus. The entire time consumed in both procedures was less than thirty seconds.

In case it is desirable to remove the lower border of the turbinated bodies, the trephine is particularly adapted to the work. That true hypertrophy will often resist chromic acid, the monochloracetic and nitric acids, makes a surgical method a necessity, and in cases in which the uneven ridge of the hardened turbinate bodies makes it difficult to use the saw except in consecutive cuts the trephine will do the work by one application. In but three or four cases have I encountered a true hypertrophy of the turbinated bodies; in these the elastic-tissue elements were in great excess, at the expense of the vascular, all erectile power being lost. In my opinion, it would be very much better to employ the expression erectile tumors to designate those tumefactions that we commonly see on the anterior portions

of the turbinated bones, which disappear upon application of cocaine, and are readily overcome by one or two applications of chromic acid; for in these the swelling seems to be due to a weakened condition of the walls of the blood-vessels, allowing permanent dilatation, and not to any proliferation or hypertrophy. In applying chromic acid for the restitution of the caliber of the meatus, we are simply bandaging the weakened and enlarged erectile structure by producing a cicatricial envelope to prevent undue distension of the glomerulus nasi, or erectile plexus. That the turbinated bodies have a normal erectile function was the almost unanimous opinion of this section expressed at the last meeting, but the word hypertrophy used to express an altered condition of this function without hyperplastic development is, in my opinion, a misnomer.

The employment of the galvano-cautery to reduce erectile tumors is advocated by some specialists. Dr. Schweig, whose battery I have here to-night, is accustomed to destroy the erectile protuberance by plunging a galvano-cautery point deep into the tumefied turbinated bodies, considering that the destruction of a portion of the vascular plexus will produce a more permanent result than the destruction or modification of the external mucous membrane. I have not been able to obtain the results by that method which I expected to theoretically, and have limited the employment of the galvano-cautery points to the destruction of tonsils and the eradication of glandular hypertrophies. The use of the cautery point on the granulations or glandular enlargements studding the post-pharyngeal wall in so-called glandular pharyngitis, or clergyman's sore-throat, I consider unnecessary, for, from the study of very many cases, I have found that disappearance of all these angry-looking red glandular islands studding the posterior wall

## 10 THE NASAL TREPHINE AND ITS ADVANTAGES.

of the pharynx takes place almost immediately on relieving the always attendant nasal stenosis.

I have simply outlined the subject for discussion by these notes that I see our chairman has seen fit to style a paper, but which I intended simply as a skeleton for future development. I trust that the members present will find the batteries, motors, and storage-cells of sufficient interest to repay them for attention to my preliminary remarks.









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